Amendments to the Claims:

1-3. (Canceled)

4. (Currently amended) A CT scanner including a processor programmed to perform ~~the~~ a method according to claim **21**.

5. (Currently amended) A method of dose modulation in CT imaging comprising:

acquiring initial transmission tomographic imaging data of an associated imaging subject using an x-ray radiation source revolving around the associated imaging subject for an initial revolution of the radiation source using a preselected level of radiation generated by the x-ray radiation source;

estimating a constant of proportionality between an x-ray current of the x-ray radiation source and attenuation of radiation raised to a selected power based on the initial transmission tomographic imaging data acquired in the initial revolution;

performing tomographic imaging by acquiring transmission tomographic imaging data of ~~an~~ the associated imaging subject using ~~a~~ the x-ray radiation source revolving around the associated imaging subject;

during the tomographic imaging, determining an estimated attenuation of radiation for an upcoming position or angular bin of the revolving radiation source based on attenuations measured at previous positions or angular bins of the x-ray radiation source; and

prior to acquiring tomographic imaging data at the upcoming position or angular bin, adjusting a level of radiation produced by the x-ray radiation source by adjusting the x-ray current proportional to ~~based on~~ the estimated attenuation of radiation raised to the selected power using the estimated constant of proportionality.

6. (Previously presented) The dose modulation method according to claim **5**, wherein the determining of an estimated attenuation of radiation includes:

estimating the attenuation based on attenuations measured for a previously acquired position or angular bin in which the radiation source was about an integer multiple of a half revolution away from the upcoming position or angular bin.

7. (Previously presented) The dose modulation method as set forth in claim 6, wherein the acquiring of tomographic imaging data includes:

relatively moving the associated imaging subject and the radiation source in a longitudinal direction generally transverse to a plane of revolution of the radiation source such that the radiation source follows a generally helical trajectory respective to the associated imaging subject.

8. (Canceled)

9. (Currently amended) The dose modulation method as set forth in ~~claim 8~~ claim 5, wherein the adjusting of an x-ray current includes:

limiting the adjusting of the x-ray current to a range defined by a minimum current value and a maximum current value.

10. (Currently amended) The dose modulation method as set forth in ~~claim 8~~ claim 5, wherein ~~the adjusting of an x-ray current includes~~ the adjusting of the x-ray current proportional to the estimated attenuation of radiation raised to the selected power using the estimated constant of proportionality comprises:

adjusting the x-ray current proportional to a square root of the estimated attenuation of radiation using the estimated constant of proportionality.

11. (Currently amended) The dose modulation method as set forth in ~~claim 8~~ claim 21, wherein the ~~adjusting~~ modulating of an x-ray current includes:

~~adjusting~~ modulating the x-ray current ~~proportional to the estimated~~ based on a combination of the determined axial radiation attenuation ~~of radiation~~ raised to a selected power and the determined baseline radiation attenuation raised to the selected power.

12. (Currently amended) The dose modulation method as set forth in ~~claim 11~~ claim 5, wherein the selected power is between about 0.1 and about 0.5.

13. (Canceled)

14. (Currently amended) ~~The~~ A method of dose modulation method ~~as set forth in claim 5, wherein the determining of an estimated attenuation of radiation includes~~ in CT imaging, the method comprising:

acquiring transmission tomographic imaging data of an associated imaging subject using a radiation source revolving around the associated imaging subject;

during the tomographic imaging, ~~the~~ determining ~~of~~ an estimated attenuation of radiation ~~includes~~ for an upcoming position or angular bin of the revolving radiation source based on attenuations measured at previous positions or angular bins of the radiation source, the determining including (i) estimating a baseline radiation attenuation based on an average attenuation over an extended range of positions preceding the upcoming position or angular bin and (ii) estimating an axial radiation attenuation based on a previously acquired position or angular bin of the radiation source disposed about a half revolution away from the upcoming position; and

prior to acquiring tomographic imaging data at the upcoming position or angular bin, ~~the~~ adjusting ~~of~~ a level of radiation produced by the radiation source ~~includes~~ based on the estimated attenuation of radiation by (i) determining a baseline x-ray current component based on a ratio of the estimated baseline attenuation of the upcoming position or angular bin and the average attenuation of the initial revolution, (ii) determining an axial x-ray current component based on a ratio of the estimated axial attenuation of the upcoming position or angular bin and a maximum or average attenuation of a present revolution, and (iii) determining ~~the~~ a total x-ray current by combining the baseline and axial x-ray current components.

15. (Original) The dose modulation method as set forth in claim 14, wherein the acquiring of tomographic imaging data includes:

acquiring helical tomographic imaging data.

16. (Curently amended) The dose modulation method as set forth in ~~claim 5~~ claim **14**, wherein the estimating of a baseline modulation attenuation includes:

estimating the baseline modulation attenuation based on an average attenuation of transmission tomographic imaging data spanning an integeter multiple of a revolution of the radiation source.

17. (Previously presented) A dose modulation processor for performing the dose modulation method set forth in claim **5**.

18-20. (Canceled)

21. (New) A method of helical CT imaging in which an x-ray source traverses a helical orbit relative to a subject, the method comprising:

acquiring CT imaging data as the x-ray source traverses the helical orbit relative to the subject;

determining an axial radiation attenuation from CT imaging data acquired previously at a point in the helical orbit about a half revolution away from a current position of the x-ray source;

determining a baseline radiation attenuation from CT imaging data acquired over a preceding at least one revolution of the helical orbit previous to the current position of the x-ray source; and

modulating an x-ray current of the x-ray source at the current position of the x-ray source based on a combination of both the determined axial radiation attenuation and the determined baseline radiation attenuation.

22. (New) The method of claim **21**, wherein the acquiring comprises revolving the x-ray source around the subject and simultaneously linearly moving the subject such that the revolving and linear moving cooperatively define the helical orbit of the x-ray source relative to a subject.

23. (New) The method of claim **21**, further comprising:

determining a constant of proportionality between x-ray current of the x-ray source and radiation attenuation raised to a selected power for use in the modulating based on CT imaging data acquired during a portion of the acquiring operation with the x-ray current set to a preselected value.